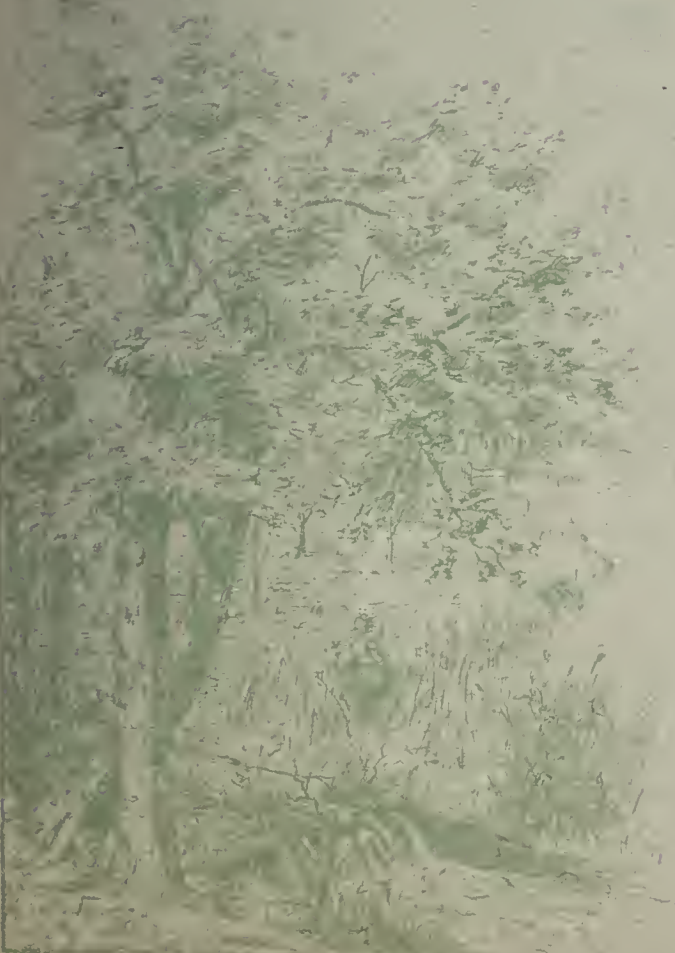




ARBOR DAY.



May 5. 1893.

State of New York.

Chapter 196.

AN ACT TO ENCOURAGE ARBORICULTURE.

APPROVED *April 30, 1888.*

The People of the State of New York, represented in Senate and Assembly, do enact as follows :

SECTION 1. The Friday following the first day of May in each year shall hereafter be known throughout this State as Arbor Day.

§ 2. It shall be the duty of the authorities of every public school in this State, to assemble the scholars in their charge on that day in the school building, or elsewhere, as they may deem proper, and to provide for and conduct, under the general supervision of the city superintendent or the school commissioner, or other chief officers having the general oversight of the public schools in each city or district, such exercises as shall tend to encourage the planting, protection and preservation of trees and shrubs, and an acquaintance with the best methods to be adopted to accomplish such results.

§ 3. The State Superintendent of Public Instruction shall have power to prescribe from time to time, in writing, a course of exercises and instruction in the subjects hereinbefore mentioned, which shall be adopted and observed by the public school authorities on Arbor Day, and upon receipt of copies of such course, sufficient in number to supply all the schools under their supervision, the school commissioner or city superintendent aforesaid, shall promptly provide each of the schools under his or their charge with a copy, and cause it to be adopted and observed.

§ 4. This act shall take effect immediately.

ARBOR DAY

May 5,



1893.



The groves were God's first temples. Ere man learned
To hew the shaft and lay the architrave,
And spread the roof above them; ere he framed
The lofty vault, to gather and roll back
The sound of anthems; in the darkling wood,
Amid the cool and silence, he knelt down,
And offered to the Mightiest solemn thanks
And supplication.—[BRYANT.]

STATE OF NEW YORK,
Department of Public Instruction,
SUPERINTENDENT'S OFFICE,

Albany, March 15, 1893.

To School Officers, Teachers and Friends of Education:

In Arbor Day we see an indication of a return to nature as a source of knowledge and happiness to the children of earth. Let us make as much as possible of the day. It is evident that appreciation of beauty in trees is, to a great extent, lacking; the taste is yet undeveloped.

The essential point is to encourage among school children a personal interest in trees, shrubs and flowers, not simply for their use in making the school grounds an attractive place but for the development of habits of observation, which, acquired in youth, are a perpetual and ever-increasing pleasure. Habits of investigation in children are too often repressed when they should be encouraged. Can you conceive what genuine personal affection a child may acquire for a tree which he has watched from a sapling to its development into a fine specimen, even if he has not planted and watered it himself, or even if it grows in a neighboring forest instead of his own field? Children must be taught impressively from earliest youth the value of trees in the economy of nature, their influence upon agriculture and civilization, and this, augmented by a genuine affection for them, establishes a high appreciation of their beauty. Memorial trees foster an affection for all trees, and it is partly by this means that we would implant in the child's mind a constantly deepening affection for trees as if they were personal friends.

Let me recommend that greater effort be made this year to instruct the young people in some of the advantages and uses of trees, some of the fundamental facts relating to their growth and structure, and particularly some explicit directions regarding the planting and aftercare of them, and let the pupils take some part in this work.

Insist on attention to the trees themselves as the matter of paramount importance, while talking and singing of them are of secondary consideration. The highest use of Arbor Day is only reached when young and old alike are moved to plant the best trees in the best way, so that they shall attain the best development and live to a green old age.

Perhaps one of the most instructive exercises in every district where the day has been heretofore observed would be an examination of the trees which had been previously set out, to see what proportion of them are thrifty and have made as good a growth as could have been expected.

Let teachers speak of preparation for Arbor Day early enough this year, not later than the first of April, that children may have opportunity for studying the budding and blossoming of the trees and may thus prepare for reading, on Arbor Day, papers founded directly on their personal observation and study. More will be learned in this manner than by reading many books on the subject. Test the truth of Agassiz's remark that "Children are born naturalists." Teach the learner to employ his own senses in the investigation of natural objects, to use his own powers of language in their description—working in the line of genuine scientific research. With us it is too often book-learning from beginning to end. We are far behind European countries in the important matter of horticultural education of children. In France there are over 26,000 primary and elementary schools where gardening is practically taught in gardens surrounding the schoolhouses. In Austria there are about 8,000 of these schools, with from one-half to two acres of cultivated land around them, where the grounds in the rear may be found planted with a large variety of trees, while at the sides and front are shrubs and flowers. See to it that our children have ample opportunity for enjoying a lesson from the book of nature.

Your attention is particularly directed to the prizes offered on another page of this circular, and your earnest endeavors are solicited to see that something is prepared that shall be worthy of the prizes offered.

I would also urge you to see that every pupil in our State learns to recognize and know the Maples, at least, this year, with their habits and peculiarities, and with this knowledge of our State tree we shall have a good foundation and beginning for a systematic study of the hundred or more trees which are natives of our State and of others which, though foreigners, are equally interesting. On another page is given a short account of the Maples with cuts.

Why should not our school officers, teachers and friends, and all who are interested in nature and in this day which we give up to a study of nature's ways, see what they can do to foster this growing love for trees and flowers? Please send to this Department, to be used in our next circular, any stories, poems, or observations which you may write or secure because they have interested you and so may interest some one else. We are in need of more good and new literature for Arbor Day—things practical as well as attractive and interesting.

Trusting that all may put forth their best efforts for the most effectual observance of Arbor Day, I am

Yours very truly,

J. F. Crooker,
Superintendent.

STATE OF NEW YORK,
Department of Public Instruction,
SUPERINTENDENT'S OFFICE,

Albany, March 15, 1893.

Dear Boys and Girls of our Public Schools :

Another spring is almost upon us and we shall soon be called to celebrate the anniversary of that day which should bring to each one of us so much of happiness, for Nature will then be putting on her fresh green gown as though preparing for a holiday, and we can not help being glad and gay if we will but look for the joyousness and gaiety that are on every side of us. How beautifully it has been said of Nature,

“ 'Tis her privilege
Through all the years of this our life, to lead
From joy to joy.”

Listen for it in the freshening breezes that whisper stories of a happier time to come and read it in the opening buds and blossoms that reveal a multitude of secrets.

I would urge you, my dear young friends, to keep your eyes open this year for all those wonders of Nature which so many people pass by with careless eye, never dreaming of the beauties that might be disclosed if they would but attend. Very true are the words of Ruskin : “ There is not a moment of any day of our lives, when Nature is not producing scene after scene, picture after picture, glory after glory, and working still upon such exquisite and constant principles of the most perfect beauty, that it is quite certain it is all done for us, and intended for our perpetual pleasure.” How few persons recognize the charm of our woods in early spring, when the first flush of woodland beauty appears to greet the smiling sun, when our trees put on that variety and harmony of apparel to celebrate the return of the spring. Do you know what trees bud earliest, and did you ever see the tiny early flowers of the Maples and the Elms? Observe this year the first tree to bud and blossom, and make a note of the tree and the date ; then follow this up with others in their turn. It is surprising how little most persons really know about the trees among which they have lived from childhood. What in nature ought to demand more attention from us than trees, in being everywhere present, of large size, of picturesque appearance and of general usefulness?

If you can not all become accomplished scientists in this line, it is at least possible for everyone to become interested in and acquainted with the trees of his neighborhood.

I would recommend to your attention this year a thorough and careful study of our Maples, an outline of which, with cuts of the leaves, will be found on another page of this circular. While not wishing to debar you from a wider study of our trees, still I desire to emphasize the request that no one, young or old, shall let this spring pass without having become acquainted with our Maples, so that you will know them anywhere and can call them by name, both common and scientific, and I shall be pleased to hear from many of my young school friends concerning their progress in this respect, and to receive good reports from your teachers also. Collect specimens of the leaves and flowers, and of the wood and bark also, if possible, but never mutilate a tree for this latter purpose ; procure such specimens when trees are being pruned. Be sure and begin your study early enough to see

the flowers on the Maples and Elms, which are so small and appear so early that you are almost sure to overlook them if not very watchful. Study the uses of these trees; which make the best lumber, to what other uses wood is put, and so on; also concerning the manufacture of maple sugar, and everything pertaining to the Maples especially.

For those who shall be able to pursue the study further than the Maples, and who can spend much of their summer vacation in such pursuit, a list of all our native State trees and a few of the more common introduced ones is given on another page, and two prizes are offered for the best collections of the same, to be sent to this Department next fall, and to form the nucleus of a permanent Arbor Day exhibit.

Let me urge you to study up the question of forestry; be instrumental in helping along this great cause. Those who live on or near farms, in the vicinity of woods or forests, should have a watchful eye in regard to forest fires, which are most frequently started on farms and every year burn tens of thousands of acres of forest land in the United States. Be practical in this work.

Our prosperity is dependent, in a large degree, upon the preservation of our forests. A good forest is only an aggregated mass of trees. When we, as a people, come to know and appreciate and love trees, we shall learn to love forests too; and once loving them, we shall appreciate their value, and efforts to preserve and maintain them and to make them useful and productive for all time will then be a comparatively easy task; but to do this you, my young friends, must grow up to love them and to appreciate their value.

Perhaps you do not realize how much foreign governments are doing to preserve their forests, and how largely forests affect the rainfall, the climate and the river courses of a country. Some of our western States have awakened to these facts and are putting forth great efforts in forest-tree planting. Nebraska particularly, so that she who was once "the treeless State" has become the pioneer State in this great work and is now thickly studded with young forests, the result of setting out from eighteen to twenty millions of forest trees a year.

It was a resident of Nebraska, Mr. J. Sterling Morton, now Secretary of Agriculture in Mr. Cleveland's cabinet, who invented "Arbor Day" and had it legalized as a holiday; and we, with many other States, have followed the example thus set us. This custom of tree-planting is not, however, new, for the Germans have a commendable habit, as one writer tells us, of each member of a family living in the rural districts planting a tree at Wissuntide, which comes forty days after Easter. The old Mexican Indians also plant trees on certain days of the year when the moon is full and name them after their children; and the Aztecs used to plant a tree every time a child was born and it bore the name of the child.

Let us then take renewed interest in this day and in the beautiful custom of planting memorial trees, remembering that at about the same time many, many others with us are endeavoring to repair the beauty of our land to atone for the ravages which civilization has made.

Wishing you a very happy springtime, and trusting that this year you may acquire a broader and deeper interest in trees and tree culture, I am

Yours very cordially,

J. F. Crooker,
Superintendent.

Planting Trees.

"The landscape, forever consoling and kind,
Pours her wine and her oil on the smarts of the mind."—[Lowell.]

TIME TO TRANSPLANT.

The first week in May will probably be the proper time for transplanting trees, but this depends altogether upon the season. Trees should be transplanted before they have budded and blossomed, for the reason that if planted later the leaves which may have opened can not obtain sufficient nourishment from the newly planted roots, and after sapping the life from the tree wither and die. It is far better to plant before any vegetation has started.

The best method, surer of success, would be to do the planting at the best season and in suitable weather, and then to have the trees labelled with name and date and dedicated afterward on Arbor Day, for the observance of Arbor Day is primarily intended to promote an interest in tree-planting, to keep prominent the importance and usefulness of the practice, and is a day to celebrate tree-planting rather than actually to perform it.

PREPARATION OF THE SOIL.

As a rule trees must have good soil in which to grow. Certain varieties seem well adapted to grow in the poorest soil, but for success in ornamental tree-planting good soil is necessary, and it should never be less than a foot deep.

In planting street trees make sure of success by properly preparing the soil where they are to stand. In all gravelly and poor soil dig a hole six or ten feet across and two or three feet deep, it can not be too large, remove the poor soil and replace with good, in which to plant the tree. In very poor soil this must be done to insure success.

SELECTION AND PREPARATION OF TREES.

The site for planting should be intelligently chosen; then the variety suited to the peculiar soil and situation and use for which it is intended should be considered.

In nature the roots of a tree push outwards in search of food and moisture and become very long and widely extended, with the young or feeding roots at the extremities so far away from the tree and so twisted among the stones in the soil and among the roots of other trees that it is not possible to get them, and when the tree is dug nothing but stiff stubs, bare of fibers, are preserved. A tree in this condition has little chance of living, for the fine fibrous or feeding roots are very necessary. They are obtained in the nursery by frequent removals or root prunings, by which the roots become compacted together and not long and widely extended as we find them in the forest. Hence it is preferable to plant nursery grown trees, which have already been once or twice transplanted and have thus acquired a good root system, and then the fine fibrous roots will not have to be sacrificed in transplanting.

In receiving plants from nurseries notice particularly two points: First, that the plants have good roots that have not been unnecessarily shortened or reduced in removal; and secondly, that the roots have not been dried or injured by frost. This can be determined by cutting off some of the ends of the roots. If the bark on them when cut into appears white and fresh and separates easily from the wood, they are sound and can be trusted. Roots should not be exposed to the sun or drying winds while being transported, but should be kept moist with a covering of straw, moss or canvas. The feeding roots are easily destroyed by exposure and their loss deprives the tree of much of its power to withstand removal successfully. This is especially true of evergreens, because of their being covered with foliage all the year.

Native trees growing near in similar soil can hardly fail to flourish if properly transplanted. Trees that have grown in open places are hardier and will bear transplanting better than those that have grown under the protection of the deeper woods. Such trees, moreover, like those from the nursery, have an abundance of fibrous roots, on which the tree must rely for support

until its stronger roots have had time to lay hold of the moist subsoil beneath. Rapidly growing trees, although giving shade soonest, are mostly short lived, and become soonest unsightly.

For a lawn a tree is wanted with all its branches — a tree as it would develop naturally from a seed on the spot and unmutilated by a pruning knife.

HOW TO PLANT.

If dug from a forest, the ragged ends of roots should be cut off, making a smooth, clean cut, with a sharp knife. The bruised and broken bark of the roots would be apt to decay and thus hinder the formation of new roots. Cut from the under side of the root, not from the upper, and then the cut surface will rest against the soil and the water can not lodge on it, even if the soil should be saturated, and everything will be more favorable for the new, healthy roots to start out. Since the tree has been moved and a part of the roots has been cut away, the tree is not in a condition to support as much foliage as will naturally appear on it as soon as the buds burst and the leaves appear. If the weather should suddenly become very warm immediately after planting, and the soil be dry, the leaves might come out before any little rootlets had formed to take up sap; and the leaves, which have "breathing pores" on their under surfaces, through which their moisture is taken up by the air, would thus quickly part with all the sap in the tree and it would wither and die. Water would be a remedy if sufficient water were given. Sometimes leaves come and remain on the tree in health, but little or no growth is made. The surest course to insure growth is to *cut back the limbs in about the same proportion that the tree has been bereft of its roots*. Then there will be fewer leaves for the sap to support, and what growth there is will be at the ends of the branches. Cut to an outside bud and then the head of the tree will grow more open; make the cut from the inside outward, just above a bud on the outside, and any crooked or misshapen branches might be cut out entirely. But do not cut off the head of the tree, if you have any sense of beauty or symmetry.

If the soil is good all that is necessary is to dig a hole a foot or more outside the longest roots. In planting the tree, place the roots naturally as deep, or a little deeper if in loose, poor soil, than when they were dug; but use judgment, for more trees are killed by too deep planting than the reverse. Force the soil among the roots firmly, working it carefully with the hand under the stem of the tree, and leaving no open spaces among the roots. The roots should not be permitted to come in contact with decaying matter of coarse, unfermented manure. Should the season be dry and warm, water may be poured in from time to time to settle the fine soil about them, but do not drench them. The practice of using water while planting can hardly be said to be a good one, and with a soil which has a tendency to clog, there is great danger of an uneven distribution and settling, with consequent empty spaces between the roots. More trees are probably killed by too much water in transplanting than by too little; but *never* wet the soil at or near the surface. The surface should be levelled, or, better, slightly rounded about the trunk of the tree. Then a mulch of coarse manure is helpful, for it keeps the surface moist, and its richness will reach the roots gradually in a diluted form. A mulch of straw, leaves, or coarse hay is better than none at all.

After the soil is properly firmed about its roots the tree should not be neglected and suffered to fall a prey to insects or fungus or allowed to starve for lack of food or water or to be loosened by the wind. Stake it carefully and firmly or insure it against accidents with a tree-box.

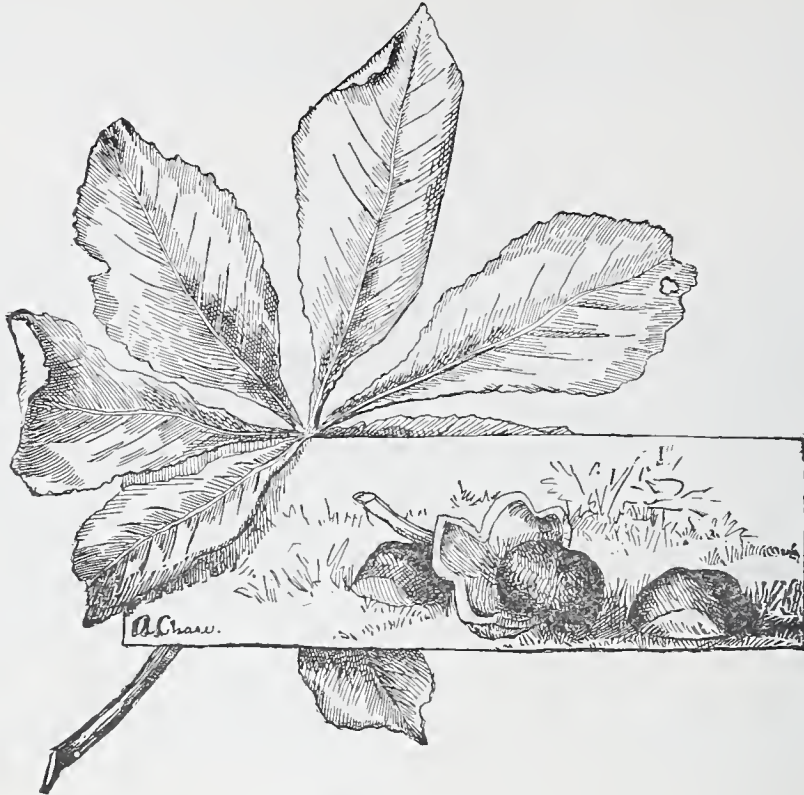
SUGGESTIONS.

Trees should not be planted so near buildings that the roots will interfere with the foundations or that their shade will make the house damp; nor so closely along roadways as to hinder the prompt drying of the road after a rain.

Do not overdo the matter of tree-planting, and do not let taste run altogether in the direction of one tree.

Do not neglect aftercare and culture. Keep the ground free from weeds and grass; prevent it from baking by a covering of mulch and by occasional hoeing and raking.

Few people realize the importance of pruning. To keep a tree shapely and in proper balance by judicious pruning is one thing; to clip it into a form unlike what it assumes naturally is another. There must be pruning, and a good deal of it too, in all well kept grounds.



A BOTANICAL BABY.

High up on the bough of a flower-budding tree,
Where the red-breasts their matins were singing,
I spied a wee cradle, a droll sight to see,
A little brown rocker hung up in the tree,
Which the wild winds kept swaying and swinging.

This rocker with scaly-brown tiles was o'er-wrought,
And with resinous balsams cemented :
And as it swayed backward and forward I caught
The sweet breath of zephyrs deliciously fraught
With the faintest of odors balm-scented.

I climbed to the bough where the cradle was hung,
For within it I longed to be peeping ;
And there, where the birds a soft lullaby sung,
And where the winds rudely their light burden swung,
Lay a pink flower-baby, — and sleeping !

The leaf-buds that swell 'neath these fostering skies
Now their seven-cleft palms are unfolding ;
But fairest of all is the baby that lies
In its little brown rocker,— an elf in disguise,
That awaits our astonished beholding.

[Through the courtesy of the author and the Educational Publishing Company, both poem and cut were furnished from "Leaves from Nature's Story-Book," by Mrs. M. A. B. KELLY.

Oh, soft was the blanket and spotless as snow,
That was carefully folded around it !
But now my heart smites me,— yet how should I know
That this infant was destined to flourish and grow
On the bough of the tree where I found it ?

It lies here beside me, a mute, lifeless thing,
For the food that was fashioned to rear it
Is hid in the boughs that now restlessly swing,
And the birds all in vain their sweet lullabies sing,
For the babe that is dead can not hear it !

Come with me, O ye who would study the ways
Of the woods and the fields and the hedges,
Come with me and see where the horse-chestnut sways
Its flower-budding branches these soft April days,
Weaving shadows with golden-flecked edges.

BUTTERCUP.

Buttercup ! Buttercup !
Hold your shining clusters up !
In each little house of gold,
What is it that I behold ?
Many soldiers straight and slim,
Golden-helmeted and prim ;
All day long so still they stand,
Never turning head or hand.

No one guesses where they stray
In the moonlight nights of May.
When the fairies are abroad
These small men keep watch and ward.
Round the fairy ring they pace
All night long, to guard the place ;
But when morning comes again,
Back are all the little men.— [St. Nicholas.

Forests and Forestry.

The future condition of our forests depends largely upon our young people who are in our schools to-day. They are the class whose ideas, eventually, will influence the policy of our State government in this matter. And so, on an occasion like Arbor Day, some few words on forests and forestry may be timely and not amiss.

The forests of our State cover an area of over 8,000 square miles, and are situated principally in the Adirondack and Catskill regions. The Great Forest of Northern New York, or Adirondack Park, is larger than the State of Connecticut. Our State owns a large part of this territory, and will ere long, it is hoped, acquire possession of it all. In the meantime these lands are under the care and control of a Department styled the Forest Commission.

In our country the woods have been destroyed so rapidly that now the percentage of forest land in the United States is less than in Europe. New York has 18 per cent of its area in forests, while Germany has 26 per cent.

The preservation of our forests is necessary for the water supply on which our rivers and canals depend; for the climatic conditions favorable to agriculture; for the sanitary benefits afforded to invalids; for the existence of fish and game; for the preservation of natural scenery; for the delightful places to which our people resort for rest and recreation; and because the land now occupied by our great forests is unfit for agricultural use. But more important than any or all these reasons is that of our future timber supply. The others are incidental to this main one; in securing that important point the others will be secured also.

The forests which clothe the slopes and plateaus of our mountain ranges have important functions to perform. They are vast, natural reservoirs in which is stored the water that supplies our navigable rivers, the streams which turn our millwheels, and the canals which contribute so largely to the commercial supremacy of our State. This storage is effected in various ways. The leaves first break the force of showers, and then deliver the water slowly to the ground. The ground, or forest floor, or humus, as it is variously called, is a loose, cellular structure, composed mostly of fallen leaves, mosses and vegetable deposits held in place by the roots of trees, and capable of holding water like a sponge. This humus, protected by the trees, and covering in our State several thousand square miles of surface, holds the rains of each season and discharges their waters slowly through the countless springs and rivulets which run to the mountain brooks, and thence to the larger streams and rivers. In summer the foliage shades the swamps, and, by protecting them from the sun, prevents evaporation, thus allowing their contents to slowly percolate through the porous soil and find their way to the rivers. The shadows of the forest also protect the deep snows which otherwise would, in early spring, melt rapidly and be discharged faster than the needs of our waterways would require. But, if our forests should be destroyed, the sun's rays would soon dry up the swamps, the humus would be converted into a hard-baked soil, down whose impacted surface the rains would run unobstructed. The shallow layer of earth, no longer held in place by trees and roots, would slide from its place on the steep slopes, leaving the mountain sides gray and bare, down whose rocky declivities the rains would pour like water from the roof of a house. Our streams and rivers would no longer preserve their even flow, but there would be destructive floods, followed by disastrous drouths. This is no theory. It has happened elsewhere, and may happen here. In other countries there are many instances where a once fertile, prosperous region has, through the removal of its forests, and the consequent loss of rainfall, been converted into a barren, uninhabited desert.

Another important function is the regulation of the climate. Forests modify the heat and cold of the seasons, temper or resist destructive winds, and influence rainfall. It has been demonstrated that farming districts are more productive where a fair proportion of forest growth is maintained, than where the entire region, however rich the soil, is kept under cultivation. In some countries one-fourth of the territory is kept in woodlands. The rule of the Duke of Burgundy was, "One-third to the hunter, two-thirds to the husbandman." William Penn made a law that one-fifth of the land should be retained in forest growth; and this at a period when the forest was deemed the greatest obstacle to colonial prosperity.

The Adirondack forests of our State exercise well-known sanitary powers whose benefits cannot be estimated in dollars and cents. Their abundant growth of balsams and other evergreens impregnate the air with the healing odors so effective in curing pulmonary diseases. Of the many consumptives who go there, over one-half are cured, or obtain permanent relief. Besides the sick, thousands find there a refuge from the summer heat of the cities, and thousands of tired and weary ones find in that retreat the quiet so necessary to their health and recuperation.

Forest destruction is due to various agencies besides the reckless use of the axe and indiscriminate timber cutting. The worst of these are the sweeping, uncontrollable fires which, in years past, have completely destroyed large areas of timber lands, leaving in their places a dreary, desolate waste. These fires start in many ways; but principally from the work of farmers in clearing land, from railroad locomotives, and from the abandoned camp fires of hunters or travellers. The Forest Commission has taken effective measures to prevent this evil; and during the past year, while forest fires were frequent in bordering States, there were none in the Adirondack or Catskill region.

Another source of wide-spread damage are the dams which, when built upon our forest streams, cause an overflow of water that soon kills the timber and converts beautiful forests into

vast pestilential swamps filled with decaying vegetation and the bare, unsightly trunks of dead trees. But the Commission finds that it cannot check this evil until there is some additional legislation of a stringent character.

The Adirondack Forests have suffered severely, also, through a blight which in recent years has killed the spruce trees in immense numbers. This extensive decay of the spruce has been attributed to various causes, but Prof. Lintner, our State Entomologist, and Prof. Peck, our State Botanist, agree that it is due to the work of a certain insect.

Considerable damage also is inflicted on woodlands by cattle which are allowed to roam at large and eat the young seedlings upon which the future growth of the woods must depend.

Forestry is the science which treats of the care, maintenance and management of forests. It teaches that their permanence is of more importance than any immediate profit which they may yield, and recognizes only such methods as will ensure a perpetual timber supply. Further, it demands such management as will ensure on a given area the greatest crop of timber at the least expense. It involves the proper selection of trees for this purpose, and the best system of cutting and removing them; the planting of suitable species, in proper time and place, in order to preserve the areas of existing woodlands and replace the timber which may be removed; the judicious and skillful thinning of young trees in order to admit light and promote the growth of the better ones; and, also, the establishment of new forests in treeless countries. It does not forbid the cutting of trees; for the matured ones may be removed with beneficial results, and the timber harvested as well as other crops. But it holds that no trees shall be removed until proper measures have been taken for the growth of others to take their place, a fundamental principle being that, in an established forest, the rate of cutting shall not exceed the rate of growth.

Forestry means far more than the mere removal of ripe trees. For instance, it does not permit the cutting of timber on steep hillsides, where the removal of even a small part of the trees might result in a shifting of the soil; nor such cutting as might injure the remaining forest by too great an admission of wind or sunlight. It provides, through an intelligent selection, for the removal of undesirable species, and fosters the retention of profitable ones; and it determines the proper admixture of hard and soft woods, so necessary in obtaining the most productive growth from the conifers.

Nature will always reforest denuded tracts in time, if they are not too badly burned; but the trained forester can assist and guide the work of Nature the same as in other agricultural work. Through his botanical knowledge, he selects for planting the species which will thrive best and yield the greatest profit under existing conditions, and attends to the many details upon which their successful propagation depends. These details, which are necessary to success, are termed by some the technical work.

Forestry has accomplished great and beneficial results. It has reforested desolate tracts where Nature, unaided, had failed to restore the tree-growth. It has converted large areas of waste land unfit for agriculture, into timber bearing tracts which have added to the wealth of the community. It has increased the fertility of our treeless States by the establishment of woodland tracts and belts of sheltering trees. In maritime districts it has covered wide wastes of sands with productive woods, and, by tree-planting along the shifting sands of the coast, it has, in many places, saved the land from the encroachment of the sea.

In the old and well established forestry bureaus of European governments the forests are so managed that they yield large revenues over and above the cost of maintenance, without any diminution of their area or density. In our country, owing to the lower markets and higher wages and the need of immediate profits, scientific methods of management are, as yet, but little practiced, however well they may be understood.

In some European countries there are Forestry schools, in which a liberal education is supplemented by practical instruction in forestry and in the technicalities of forest management. There are colleges in our own country where this subject now receives special attention; and it has been suggested that ere long our State should establish a Forestry Academy in the Adirondacks, where there are so many favorable opportunities for carrying on the practical work necessary to a proper course of instruction.

WILLIAM F. FOX, *Superintendent State Forests.*

A LESSON.

A corn-stalk glanced down at some grasses,

And said in an arrogant tone,

"I wish that my fawning relations

Would move off and leave me alone.

"Just see how they mix with the clovers,

And nod at their red and white crests;

And even the poor silly daisies

They're ready to welcome as guests!

"No wonder each morn when they waken,

Their eyelids are heavy with tears,

Through envy of my rustling raiment,

And the gold drops that shine in my ears.

"'Tis true, we've a common venation;

But that need not addle their brains;

They're born to a lowly position,

There's no blood of mine in their veins."

With that she threw back her silk tassels,

And left them to wave in the breeze,

Nor took farther note of the grasses

That timidly crouched at her knees.

In autumn, a reaper discovered

The corn-husk all withered and dried,

So he stripped off her bright golden ear-drops,

And ruthlessly cast her aside;

And when the next Spring's glowing sunshine

Caused nature her white robe to doff,

And the earth showed a few snowy patches,

Like a cake with the frosting picked off;

I said of the pale, slender fingers

That the roots of the grasses sent forth,

"Ah, surely, the proud are made stubble,

And the meek shall inherit the earth!"

[By permission, from "Leaves from Nature's Story-Book," by Mrs. M. A. B. KELLY.]

Prizes Offered.

Two prizes of \$25 each are offered by the Department this year to insure a more careful examination and study of our trees, with their flowers, leaves and fruit, and to create a deeper interest in our Arbor Day work.

The first prize will be awarded for the neatest, most complete and perfect collection of herbarium specimens of our State trees collected and sent in by a member of a high school of the State. The second prize will be awarded for a similar collection sent in by a member of a union free school or a common school of the State.

Honorable mention will be made in our next Arbor Day circular of persons sending in other collections of special merit.

The collections must consist strictly of our native trees as given on third page of cover. No specimen will be considered perfect without leaves, flowers and fruit, if the tree bears flowers and fruit. Specimens must be neatly mounted, properly labeled, and arranged in orders, according to directions following. Collections must be forwarded to the Department not later than December first next.

Directions

FOR

Collecting and Preserving Herbarium Specimens of Trees.

An herbarium is a great aid in the study of plants. It consists of a collection of plant specimens properly dried, mounted, labeled and arranged. Probably no botanist ever attained much prominence as such, or ever became proficient in this science without making an herbarium.

It is evident that small plants only can be preserved entire in an herbarium. Trees are too large and must be represented by small parts of themselves. They are generally represented in herbaria by one or several of their small branches bearing the leaves and flowers and when possible the fruit also. In some instances the fruit is so thick and hard that it must be preserved separately.

The directions for making a collection of specimens illustrative of our trees should treat of the apparatus and materials needed, the character of the specimens to be collected, the time when they should be taken and the method of drying, mounting and arranging them.

MATERIALS NEEDED.

A knife will be needed with which to cut the desired branches from the tree; a receptacle also in which they may be placed and carried home. This may be an ordinary botanical collecting-box, a portable wire press or a portfolio. A suitable number of plant driers will be needed in which to dry and press the specimens. These are thick, felty sheets, 12 by 18 inches in size, made expressly for this purpose. If these cannot be obtained conveniently, pieces of this size may be cut from carpet paper or from old newspapers. A considerable number of folios of manilla or other smooth, soft paper should be procured. These should be of the same size as the driers. The mounting paper should be firm, white and smooth, 11½ by 16½ inches. A few white paper or pasteboard boxes, 1½ inches deep, 4 inches wide and 6 inches long, will be needed for the reception of such fruits as cannot be mounted on the herbarium sheets. The labels should be 1¾ by 3¾ inches. Liquid glue or Mead's adhesive plaster will be needed in fastening the specimens to the herbarium sheets. The latter is more convenient and cleanly. Mucilage or gum tragacanth softened in water will be useful in attaching the labels. The plant press may consist simply of two pieces of well-seasoned planed boards, each 18 inches long, 12 inches wide and 1 inch thick.

COLLECTING SPECIMENS.

In collecting specimens it is desirable that the part selected should show as many of the characters of the species as possible. If a branch bears, at the same time, leaves, flowers and fruit, it will be preferable to one that bears leaves only, and should be selected. A branch that is itself well formed and smooth and that has its leaves perfect is to be chosen rather than one that is crooked or knotty or has its leaves eaten by insects or ragged or torn by the wind or discolored by injury or age. Such specimens should not be taken. It is well to take a branch that

has branchlets, if not too large, as it may also show the mode of branching, but in all cases the size of the mounting paper must be kept in view, and no specimen should be taken that is more than 16 inches long or more than 11 inches wide. Two small specimens will sometimes be better than one large one. Having made the selection, do not tear or break the branch from the tree, but cut it. Place it at once in the collecting box or between the leaves of a folio and then in the wire press or the portfolio. If exposed to the air and the sun until the leaves wither the specimen will be spoiled. If placed in the folio at the time of collecting care must be taken to arrange the leaves just as you wish them to appear in the dried specimen, for they should not be removed from the folio till completely dry. The same rule is applicable when the specimen is taken from the collecting box and placed in the folio preparatory to putting in press. Several leaves should not be allowed to overlap each other and form a thick mass. It is well to have one or more lie in such a position that when mounted the lower surface will be shown. Do not leave any in a folded or crumpled position, and put no specimen in the folio with water on its leaves or flowers.

A few trees, like the elms and some of the maples put forth their blossoms early in the spring before the leaves have appeared. In such cases flower-bearing branches must be taken while the flowers are on them. Then the same tree must be visited again for a fruiting specimen, and even a third time, if necessary, for a mature leaf-bearing specimen. Generally the leaves will be sufficiently mature when the fruit is; but in the case of some of the nut-bearing trees it will be better to get leaf-bearing branches before the fruit is mature, since this matures so late in the season that it is then difficult to find branches bearing perfect foliage. Some trees, like the basswood and the tulip tree, have the leaves and flowers developed at the same time, and branches having both may be taken at once. It may, however, be necessary to visit such trees a second time for a fruit-bearing specimen. The flowers of these trees are perfect; that is, in each flower the organs called stamens and pistils may be seen. Many trees have flowers of two kinds; that is, some of their flowers have stamens only and are called staminate flowers, others have pistils only and are called pistillate flowers. In many cases, as in the nut-bearing trees, the birches and the cone-bearing trees, these two kinds of flowers occur on the same tree and often on the same branch. In other trees, like the poplars and willows, they occur on distinct trees of the same species. In such cases the individual flowers are often very small, and either one or both kinds are developed in rather long, narrow clusters, called aments. In the nut-bearing trees the staminate flowers are generally in aments, but the pistillate flowers are not. In the maples the three kinds of flowers, perfect, pistillate and staminate, are sometimes found on the same tree, often in clusters or racemes, but not in aments. In collecting specimens of these trees all kinds of flowers belonging to the species should be shown by the specimens. In the case of the maples and other trees bearing fruit in large clusters, it may be well to thin out the clusters somewhat before putting the specimen in the press.

DRYING SPECIMENS.

The object of drying specimens is to preserve them for future reference, examination or study. To have them in as good condition as possible for this purpose, they are dried under pressure, the moisture in them being absorbed by the driers in which they are placed. The quicker they are dried the better they retain the natural color of the foliage and flowers. This result is attained by using a liberal quantity of driers, by frequently changing the specimens from the dampened driers to dry ones and by exposure to a dry atmosphere.

Having placed several thicknesses of driers on one of the boards of the press, place upon these a folio containing a specimen or specimens, placed in it according to the directions previously given. Place on this folio a strip of paper with one end projecting beyond the margin of the folio. The object of this is to facilitate the transfer of the specimen to fresh driers. Then place over the folio several thicknesses of driers, the more the better. Then another specimen-bearing folio, another strip of paper and another package of driers. Continue building the pile till all the specimens to be pressed are placed between the driers. Finally place the other piece of board on top of the pile and put upon it any heavy weight or weights. A hundred pounds will not be too much. More still will be better if the pile is large. If the press can lie in a warm room or a hot garret, or be exposed to a hot summer sun, all the better. A sufficient number of driers should be had in reserve so that the next morning the specimens may be transferred from the first lot to these fresh ones. In making the transfer, take the upper board of the press from the pile and now use it for the bottom. Put on it a suitable number of fresh driers. Remove the upper layer of driers of the old pile down to the uppermost folio. The projecting paper slip enables you to do this at once. Then transfer the folio and its contained specimen, also its paper slip, to the new pile of driers and place upon it more fresh driers. Repeat this operation till all the specimens have been transferred to the pile, on which place the remaining board and the weights again. Spread out the dampened driers to dry and the next day change the specimens again to these or to other fresh driers. This process should be repeated every day or two (or less often after two or three changes) till the specimens are dry.

MOUNTING SPECIMENS.

In mounting specimens with liquid glue a small brush with a handle of convenient length may be used in applying the glue. Even a small brush handle with one end flattened will answer very well. Dip it in the glue and apply to the side of the branch which is to lie in contact with

the herbarium sheet. The glue should be applied in two or three places only and in small quantity. Do not apply it to the leaves. If the glue is too thick it may be reduced by the addition of a little vinegar or acetic acid. Specimens neatly mounted with glue appear better than those attached by adhesive plaster. Still this has some advantages. It is more convenient to use and it holds very smooth-stemmed specimens better than glue does. It can also be removed if for any reason it is desirable to take the specimen from the herbarium sheet. The adhesive plaster should be cut in strips $\frac{1}{12}$ to $\frac{1}{8}$ inch wide and of any convenient length. Generally one inch is long enough. In using the strips, having placed the specimen in its proper position on the sheet, place the middle of a strip on the branch near its base, so that the ends of the strip shall project at right angles to the branch. Then press down the ends firmly on the paper, to which they will adhere. In like manner put another strip across the branch near the other end, and also fasten the lateral branches to the paper in the same, if necessary. Two or more specimens of the same species may be mounted on the same sheet if there is sufficient room, but specimens of two species should never be placed on one herbarium sheet. In mounting the specimens always leave sufficient room for the label at the lower right hand corner of the sheet.

Specimens of the hemlock and the black and white spruces do not retain their leaves well when dried in the usual way. To avoid this difficulty as much as possible, select for specimens the most slender branches without cones, and with a brush apply mucilage or very thin glue to the whole surface that is to lie on the paper, working it well in toward the base of the leaves. Then apply the specimen at once to the herbarium sheet or to a smaller piece of firm white paper that may be attached to the herbarium sheet. Place over it a piece of coarse cotton cloth and place it in the driers, putting on very heavy weights so that it may dry under great pressure. The leaves, when dry, will be held in place by the mucilage.

The label should contain: 1st, the botanical name; 2d, the common name; 3d, the name of the locality where the specimens on the sheet were collected and of the month or months in which they were collected; 4th, the name of the collector. These names should stand in the order in which they have been named, the first near the upper part of the label, the second under it, and so on. The place where and time when collected should be indicated on the same horizontal line. These names may be written or printed on the label, and should be placed upon it before it is fastened to the herbarium sheet. In attaching the label it will be sufficient to touch with a small brush previously dipped in mucilage or with a small, flat-pointed stick dipped in softened gum tragacanth, the four corners of the label and two or three intermediate points near the margin. This will be better than to cover the whole back of the label with the adhesive material.

After the specimens have been mounted they should be arranged according to their botanical relationship or classification. All the sheets holding specimens of maples should be placed together in a folio of firm manilla or other colored paper which, when folded, shall be 17 inches long and 12 inches wide, and the name of the genus (*Acer* in this case) should be written or printed on the lower right hand corner. In the same way all the sheets holding specimens of pines should be placed together, and so for any other genus. Large cones, nuts or other fruits, too bulky to be placed on the herbarium sheet, should be put in the boxes provided for this purpose, the fruit of each species in a box by itself. The label of the species, properly filled out, should be attached to the cover of the box. These boxes, systematically arranged, may be kept in cabinet drawers.

CHARLES H. PECK,
State Botanist.

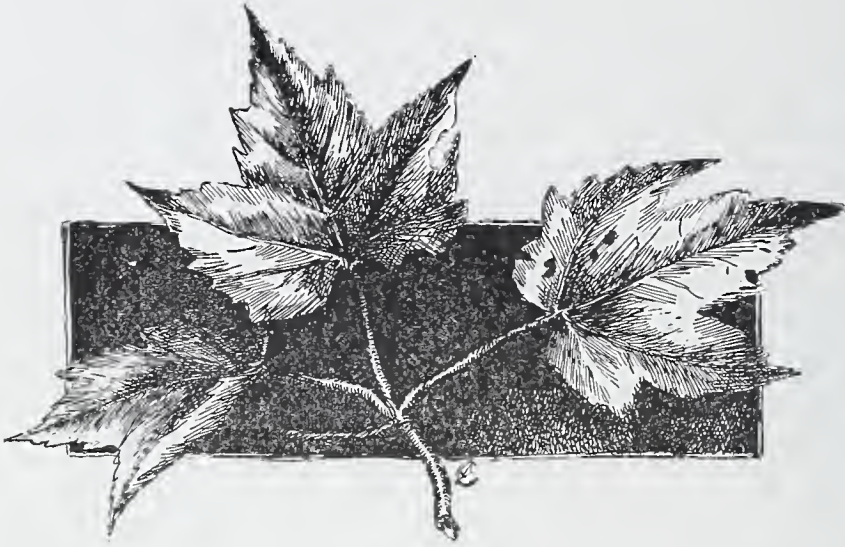
THE VIOLET.

Dear little violet,
Don't be afraid,
Lift your blue eyes
From the rock's mossy shade.
All the birds call for you,
Out of the sky;
May is here waiting,
And here, too, am I.

Why do you shiver so,
Violet sweet?
Soft is the meadow grass
Under my feet.
Wrapped in your hood of green,
Violet, why
Peep from your earth door
So silent and shy?—[*Lucy Larcom.*]

There is a pleasure in the pathless woods,
There is a rapture on the lonely shore;
There is society where none intrudes
By the deep sea and music in its roar.
I love not man the less but Nature more,
From these our interviews, in which I steal
From all I may be, or have been before,
To mingle with the universe, and feel
What I can ne'er express, yet can not all conceal.—[*Lord Byron.*]

The Maples.



"A student who has learned to observe and describe so simple a matter as the form of a leaf has gained a power which will be of lifetime value, whatever may be his sphere of professional employment."—[*William North Rice*].

There are some sixty or seventy species of the Maple, nearly half of them belonging to China and Japan, which must be considered the headquarters of the genus. In North America only nine species occur, of which five are natives of our own State.

The Maples, in general, are lofty and beautiful trees, and are planted much for ornament. Capable of enduring an intense degree of cold, they form, in the north of the Old and of the New Continent, extensive forests.

One of the principal characters of the Maple consists in opposite leaves divided into several very distinct lobes. The flowers of most of them are very small and appear so early, generally in April, before there are any signs of leaves, that without careful attention one is very likely to overlook them altogether. The staminate and pistillate flowers often appear on different trees, sometimes on the same tree, and also sometimes perfect flowers with them.

The fruit is the distinctive feature of the Maple and consists of two samaras, or keys, as they are called—that is, little winged nuts or seeds. With the exception of the Silver-leaved Maple and the Red Maple, which perfect their seeds in May, the seeds of the Maples ripen in October, when the keys begin to turn brown.

The Maples prefer a free, deep, loamy soil, rich rather than sterile, and neither wet nor very dry; a sheltered and shady situation suits them best. Though they only attain perfection in favorable soils and situations, they will spring up and live in any situation whatever.

They are propagated chiefly from seeds; but some sorts are increased by layers, by cuttings of the shoots or roots, or by budding or grafting. Although the seeds may be sown either in autumn or in spring, the latter is preferable where moles abound, as they are very fond of the seeds. When sown in spring they come up in five or six weeks. The seeds of the Silver and Red Maples should be sown immediately after having been collected, for they will vegetate directly and produce fine plants the first season, if kept free from weeds.

The wood of the Maple is light, close-grained, and moderately hard. The bark is stringent, and yields red and yellow coloring matter, and the limpid sweet sap is manufactured into sugar. The most valuable timber trees of the genus are the European *Acer Pseudo-Platanus* (introduced here), the American *Acer saccharinum* and an Indian species.

The Maple was called *Acer* by the Romans, perhaps from its sharp-pointed leaves, though some authorities say it was so called because its tough wood was employed for the handles of pointed weapons, spears, javelins and the like.

1. ACER SPICATUM — MOUNTAIN MAPLE.



A. spicatum.

Common in the region of the St. Lawrence valley and abounds among the enormous rocks that lie scattered along the sides of the Mohawk, near the Little Falls. Called Mountain or Low Maple, for it grows of preference in cool, moist and shady situations, on the abrupt and rocky banks of torrents and rivers. Small, bushy tree, 6 to 10 feet high, with a short trunk 6 or 8 inches in diameter. Bark very thin, with smooth or slightly furrowed reddish-brown surface. Leaves with three (rarely five) coarsely serrated, taper-pointed lobes, with slightly cordate base; downy beneath. Flowers minute and greenish-yellow, in erect, slender racemes or panicles, blooming in June after the leaves are fully grown. Wings of the small fruit at about a right angle; fruit fully grown and bright red in July, turning brown late in the autumn.

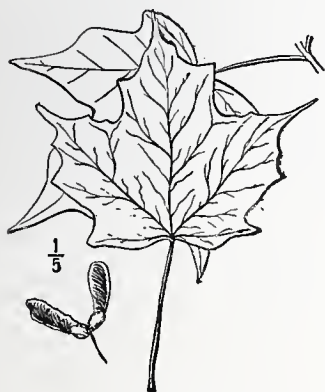
2. ACER PENNSYLVANICUM — STRIPED MAPLE.

Wild throughout and cultivated. Small, slender tree, 30 or 40 feet high. Bark from $\frac{1}{8}$ to $\frac{1}{4}$ inch thick, light green, striped with brownish red. Leaves large, thin, three-lobed at the end, cordate at the base, sharply, doubly serrate, the short lobes contracted into tapering serrate points; 5 or 6 inches long and 4 or 5 inches broad. Flowers greenish-yellow, in drooping, elongated, loose racemes, appearing after the leaves toward the end of May or in early June. Fruit with thin spreading wings, $\frac{3}{4}$ inch long and marked on one side of each nutlet by a small cavity. One of the earliest trees whose vegetation announces the approach of spring. Its buds and leaves, when beginning to unfold, are rose-colored. This Maple has few economic uses. In some parts of the country cattle are turned into the forest in the early spring to browse on the young and tender shoots filled with saccharine juice, which are the favorite food of the moose and the deer. Its principal value, however, consists in its beauty. The excellent habit of this small tree, the brilliancy of its young leaves and bud-scales in early spring, its handsome, graceful flowers, its large, bright summer foliage and brilliant autumn colors and the conspicuous markings of its trunk and branches, more striking in winter even than in summer, make it a valuable garden plant, beautiful at all seasons of the year.



A. Pennsylvanicum.

3. ACER SACCHARINUM — SUGAR OR ROCK MAPLE.



A. saccharinum.

The most interesting of the American Maples. A noble tree, 50 to 120 feet high, with a trunk 3 or 4 feet in diameter, very symmetrical, with a narrow, egg-shaped head when young, and when 50 or 60 years old, with a broad, round-topped dome, often 70 or 80 feet across. Bark of large trees, from $\frac{1}{2}$ to $\frac{3}{4}$ inch thick, broken into deep longitudinal furrows, the light brown surface separating into small scales; bark of young trunks and young branches whitish brown. Wild throughout and extensively cultivated in the streets of cities. Leaves deeply three to five-lobed, with rounded notches; lobes acute, few toothed; base, heart-shaped; smooth above, glaucous or paler beneath, turning in autumn to brilliant shades of deep red, scarlet and orange, or of clear yellow. Flowers greenish-yellow, hanging in umbel-like clusters at the time the leaves are expanding in the spring. Fruit with wings not quite forming a right angle; wings from $\frac{1}{2}$ inch to rather more than an inch in length, broad and thin. Wood heavy, strong, closegrained and tough, with a fine, satiny surface, susceptible of receiving a good polish; light brown tinged with red; more valuable and more generally used than that of any other American Maple.

Var. *nigrum* — Black Sugar Maple. Forms a forest of considerable size on the banks of the Genesee. Leaves usually three-lobed, with entire or bluntly toothed lobes, frequently thinner than those of the common form of Sugar Maple, scarcely paler beneath, but often minutely

downy, notch at the base often closed. Generally found on lower ground than the common form, occupying as a rule the banks of streams or rich alluvial river bottom lands.

The hardiness of the Sugar Maple, its rapid growth in good soil, its excellent habit, the grace of its flowers, the beauty of its foliage, especially in autumn, and its freedom from serious disease make it one of the most valuable ornamental trees in North America, and it is now planted in immense numbers in the northern States for shade and for the embellishment of streets, roadsides and parks.

4. ACER DASYCARPUM — SILVER OR WHITE MAPLE.

Large tree, 90 to 120 feet high, rapidly growing and somewhat weeping, with soft, white wood. Bark $\frac{1}{2}$ to $\frac{3}{4}$ inch thick, reddish brown and more or less furrowed, its surface separating into large, thin scales; bark of young stems and large branches smooth and gray, tinged with red. Leaves large and deeply five-lobed, the middle lobe often being three-lobed, with blunt notches, the lobes irregularly serrated and notched, truncate or somewhat heart-shaped at the base, 6 or 7 inches in length and rather less in breadth, membranous, bright pale green on the upper surface and silvery white, and, when young, downy beneath. Flowers light greenish-yellow, preceding the leaves, in crowded umbels along the branches. Fruit ripens in May or June; wings large and forming about a right angle. Wood hard and strong, close-grained and easily worked, but rather brittle. Wild along river banks and extensively cultivated in the streets of cities. Grows very rapidly in cultivation, even on dry soil, and for this reason has been planted extensively as a shade and street tree. When grown under favorable conditions it forms a wide-spreading head. On dry and elevated ground however, it is not handsome except when young; the branches become brittle and are easily broken and the habit is loose and unattractive. Special cut-leaved and weeping varieties are sold at the nurseries.



A. dasycarpum.

5. ACER RUBRUM — RED MAPLE.



A. rubrum.

A slender tree, 80 to 120 feet high, somewhat spreading, with reddish branches. Wild in wet places and often cultivated. Bark dark gray, divided by longitudinal ridges, the surface separating in large flake-like scales. Leaves truncate, more or less cordate, rounded or wedge-shaped at the base, and cleft into three to five acute-notched, irregularly toothed lobes, whitish beneath, turning a bright crimson and orange in autumn. Flowers bright scarlet or dull yellowish-red, in close clusters along the branches, appearing before the leaves in the spring. Fruit often reddish, small, with the wings at about a right angle. Wood heavy, close-grained, easily worked and not very strong, light brown, often tinged with red, now largely used in the manufacture of furniture. Ink made domestically by boiling bark of Red Maple in soft water and combining the tannin which it contains in large quantities with sulphate of iron

[The authorities cited are Sargent's *Silva of North America*, Micheaux & Nuttall, and Apgar's *Trees of the Northern United States*. To the American Book Company and the author of this latter convenient little handbook are due sincere thanks for the cuts of the leaves. The large cut which heads this article is furnished through the courtesy of the Educational Publishing Co. of Boston.]